# TRANSACTIONS

OF THE

# American Society of Civil Engineers.

---

## INDEX.

## VOLUME XL.

DECEMBER, 1898.

---

NOTE.—In this Index, Subjects and Writers are given Alphabetically. Titles of Papers are enclosed by quotation marks when indexed alone or under the Author's name. When indexed under the name of a person discussing a paper, the titles are not so enclosed. Titles are entered with reference to the subject and also under the first significant word.

# INDEX.

## VOLUME XL.

DECEMBER, 1898.

---


ADAMS, ARTHUR L. Flow of Water in Pipes, 542.

ARCHES.

"Three-Hinged Masonry Arches; Long Spans Especially Considered." David A. Molitor. (With Discussion.) 31.

"Niagara Railway Arch." R. S. Buck. (With Discussion.) 125.

BERG, WALTER G.

Three-Hinged Masonry Arches, 77.

Marine Wood-Borers, 210.

Preservation of Piles, 210.

BLASTING.

To Remove Bars in Rivers. J. A. Ockerson, 241; L. M. Haupt, 344.

BRAUNE, G. M. Niagara Railway Arch, 166.

BRIDGES.

"Niagara Railway Arch." R. S. Buck. (With Discussion.) 125.

"Three-Hinged Masonry Arches; Long Spans Especially Considered." David A. Molitor. (With Discussion.) 31.

BRINCKERHOFF, H. W. Reservoir System of the Great Lakes, 431.

BUCK, L. L. Niagara Railway Arch, 158.

BUCK, R. S. "The Niagara Railway Arch," 125, 171.

CAMERON, BREWSTER. Jetty Construction, 110.

CAMPBELL, H. H. Relation of Tensile Strength to Composition in Structural Steel, 457.

CHITTENDEN, HIRAM M. "Reservoir System of the Great Lakes of the St. Lawrence Basin; Its Relation to the Problem of Improving the Navigation of These Bodies of Water and of Their Connecting Channels, 355, 443.

COLLINGWOOD, FRANCIS.
Marine Wood-Borers, 212.
Preservation of Piles, 212.

CONCRETE. "Three-Hinged Masonry Arches; Long Spans Especially Considered." David A. Molitor. (With Discussion.) 31.

COPPÉE, H. ST. L.
Dredges and Dredging on the Mississippi River, 324.
Primitive Methods of Dredging, 324.

CROSBY, B. L.
Marine Wood-Borers, 211.
Dredges and Dredging on the Mississippi River, 311.

CUNNINGHAM, A. C. Relation of Tensile Strength to Composition in Structural Steel, 456.

CURRENT DEFLECTORS. J. A. Ockerson, 231, 348; B. L. Crosby, 311; L. J. Le Conte, 316; W. S. Mitchell, 321; L. M. Haupt, 340.

DREDGES.
Hydraulic—J. A. Ockerson, 215, 348; Edward Flad, 311; B. M. Harrod, 314; L. J. Le Conte, 316; W. H. Wheeler, 318; W. S. Mitchell, 321; H. St. L. Coppée, 324; A. F. Woolley, 329; L. M. Haupt, 343; A. W. Robinson, 345.

"DREDGES AND DREDGING ON THE MISSISSIPPI RIVER." J. A. Ockerson, 215.
Discussion: B. L. Crosby, 311; Edward Flad, 311.
Correspondence: B. M. Harrod, 314; L. J. Le Conte, 316; W. H. Wheeler, 318; W. S. Mitchell, 321; H. St. L. Coppée, 324; A. F. Woolley, Jr., 329; L. M. Haupt, 340; A. W. Robinson, 345; J. A. Ockerson, 348.

DREDGING.
"Dredges and Dredging on the Mississippi River." J. A. Ockerson. (With Discussion.) 215.
Primitive Methods of— H. St. L. Coppée, 324.

DUNHAM, H. F. Flushing in Pipe Sewers, 28.

"EXPERIMENTS ON THE FLOW OF WATER IN THE SIX-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah." Charles D. Marx, Charles B. Wing and Leander M. Hoskins, 471.
Discussion: Gardner S. Williams, 528; John C. Trautwine, Jr., 528; Henry Goldmark, 529; Emil Kuichling, 530.
Correspondence: Arthur L. Adams, 542; Theron A. Noble, 546; Edmund B. Weston, 548; L. J. Le Conte, 548; D. C. Henny, 550; C. D. Marx, C. B. Wing and L. M. Hoskins, 555.

FIELD, BURR KELLOGG. Memoir of— 568.

FLAD, EDWARD. Dredges and Dredging on the Mississippi River, 311.

FLOW OF WATER. See "*Water, Flow of.*"

"FLUSHING IN PIPE SEWERS," H. N. Ogden, 1.
Discussion: Rudolph Hering, 15; James H. Fuertes, 20; G. W. Tillson, 27; H. F. Dunham, 28.
Correspondence: Wm. B. Landreth, 29; L. J. Le Conte, 29.

FORMULA.
Kutter's — C. D. Marx, C. B. Wing and L. M. Hoskins, 506, 516, 564; A. L. Adams, 544, 545; T. A. Noble, 546, 547; L. J. Le Conte, 550; D. C. Henny, 550.
Weisbach's — E. Kuichling, 535.

FUERTES, JAMES H. Flushing in Pipe Sewers, 20.

GAUGES.
Bourdon— C. D. Marx, C. B. Wing and L. M. Hoskins, 472.

GOLDMARK, HENRY.
Three-Hinged Masonry Arches, 78.
Niagara Railway Arch, 161.
Flow of Water in Pipes, 529.

GREAT LAKES, Reservoir System of the— H. M. Chittenden and James A. Seddon. (With Discussion.) 355, 401.

GULF OF MEXICO, "Origin of the Gulf Stream and Circulation of the Waters in the— with Special Reference to the Effect on Jetty Construction." N. B. Sweitzer, Jr. (With Discussion.) 86.

GULF STREAM, "Origin of the— and Circulation of the Waters in the Gulf of Mexico, with Special Reference to the Effect on Jetty Construction." N. B. Sweitzer, Jr. (With Discussion.) 86.

HARROD, B. M.
Marine Wood-Borers, 210.
Preservation of Piles, 210.
Dredges and Dredging on the Mississippi River, 314.

HAUPT, L. M.
Origin of the Gulf Stream, 99.
Circulation of Waters in the Gulf of Mexico, 99.
Jetty Construction, 101.
Dredges and Dredging on the Mississippi River, 340.
Current Deflectors, 340.
Blasting, to remove Bars in Rivers, 344.

HENNY, D. C. Flow of Water in Pipes, 550.

HERING, RUDOLPH. Flushing in Pipe Sewers, 15.

HOSKINS, LEANDER M. "Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah," 471, 555.

HYDRAULICS.
"Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah." Charles D. Marx, Charles B. Wing and Leander M. Hoskins. (With Discussion.) 471.

IMPROVEMENT OF RIVERS.
"Dredges and Dredging on the Mississippi River." J. A. Ockerson. (With Discussion.) 215.

JETTY CONSTRUCTION.
"Origin of the Gulf Stream and Circulation of the Waters in the Gulf of Mexico, with Special Reference to the Effect on Jetty Construction." N. B. Sweitzer, Jr. (With Discussion.) 86.

JOHNSON, J. B.
Three-Hinged Masonry Arches, 77.
Niagara Railway Arch, 164.
Reservoir System of the Great Lakes, 432.

KASTL, ALEXANDER E.
Circulation of Waters in the Gulf of Mexico, 115.
Jetty Construction, 115.

KNAP, J. M. Niagara Railway Arch, 151.

KUICHLING, EMIL.
Flow of Water in Pipes, 530.
Mercury, Specific Gravity of— 531.

LANDRETH, WM. B. Flushing in Pipe Sewers, 29.

LE CONTE, L. J.
Flushing in Pipe Sewers, 29.
Marine Wood-Borers, 212.
Preservation of Piles, 212.
Dredges and Dredging on the Mississippi River, 316.
Flow of Water in Pipes, 548.

LEWINSON, M. Niagara Railway Arch, 155.

LINDENTHAL, GUSTAV.
Three-Hinged Masonry Arches, 80.
Niagara Railway Arch, 153.

LOVETT, THOMAS DAVIS. Memoir of— 571.

MANLEY, HENRY.
Marine Wood-Borers, 210.
Preservation of Piles, 210.

MANOMETERS. "Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah." C. D. Marx, C. B. Wing and L. M. Hoskins. (With Discussion.) 471.

"MARINE WOOD-BORERS." Charles H. Snow, 178.
Discussion: Walter G. Berg, 210; B. M. Harrod, 210; Henry Manley, 210; B. L. Crosby, 211; Robert Moore, 211.
Correspondence: Francis Collingwood, 212; L. J. Le Conte, 212.

MARX, CHARLES D. "Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company at Ogden, Utah." 471, 555.

"MATHEMATICAL ANALYSIS OF THE INFLUENCE OF RESERVOIRS on Stream-Flow." James A. Seddon, 401, 441.

MEMOIRS.
William Ezra Worthen, 565.
Burr Kellogg Field, 568.
Thomas Davis Lovett, 571.
Mirtiliano Sicard, 577.
Henry Clay Yeatman, 579.

METCALF, WILLIAM. Relation of Tensile Strength to Composition in Structural Steel, 458.

METERS.
Venturi— "Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah." C. D. Marx, C. B. Wing and L. M. Hoskins. (With Discussion.) 471.

MISSISSIPPI RIVER. Dredges and Dredging on the— J. A. Ockerson. (With Discussion.) 215.

MITCHELL, W. S. Dredges and Dredging on the Mississippi River, 321.

MOLITOR, DAVID A. "Three-Hinged Masonry Arches; Long Spans Especially Considered." 31, 83.

MONCRIEFF, J. M. Niagara Railway Arch, 162.

MOORE, ROBERT.
Marine Wood-Borers, 211.
Preservation of Piles, 211.

NAVIGATION. "Reservoir System of the Great Lakes of the St. Lawrence Basin; Its Relation to the Problem of Improving the —of these Bodies of Water and Their Connecting Channels." Hiram M. Chittenden. (With Discussion.) 355.

"NIAGARA RAILWAY ARCH." R. S. Buck, 125.
Discussion: J. M. Knap, 151; J. W. Schaub, 151; Gustav Lindenthal, 153; M. Lewinson, 155; F. W. Skinner, 155; L. L. Buck, 158.

Correspondence: Henry Goldmark, 161; J. M. Moncrieff, 162; J. B. Johnson, 164; G. M. Braune, 166; R. S. Buck, 171.

NOBLE, THERON A. Flow of Water in Pipes, 546.

OCKERSON, J. A. "Dredges and Dredging on the Mississippi River," 215, 348.

OGDEN, H. N. "Flushing in Pipe Sewers," 1.

"ORIGIN OF THE GULF STREAM AND CIRCULATION OF the Waters in the Gulf of Mexico, With Special Reference to the Effect on Jetty Construction." N. B. Sweitzer, Jr., 86.

Discussion: L. M. Haupt, 99; Thomas D. Pitts, 106; Brewster Cameron, 110.

Correspondence: George Y. Wisner, 113; A. F. Wrotnowski, 114; Alexander E. Kastl, 115; Thomas L. Raymond, 116; H. C. Ripley, 117; N. B. Sweitzer, Jr., 122.

PIEZOMETERS.

"Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah." C. D. Marx, C. B. Wing and L. M. Hoskins. (With Discussion.) 471.

PILES.

Hydraulic Mooring— J. A. Ockerson, 248.

Preservation of— Chas. H. Snow, 203; Walter G. Berg, 210; B. M. Harrod, 210; Henry Manley, 210; Robert Moore, 211; F. Collingwood, 212; L. J. Le Conte, 212.

PIPE.

"Experiments on the Flow of Water in the Six-Foot Steel and Wood— Line of the Pioneer Electric Power Company, at Ogden, Utah." Charles D. Marx, Charles B. Wing and Leander M. Hoskins. (With Discussion.) 471.

PITTS, THOMAS D.

Circulation of Waters in the Gulf of Mexico, 106.

Jetty Construction, 106.

PUMPS.

Centrifugal— "Dredges and Dredging on the Mississippi River." J. A. Ockerson. (With Discussion.) 215.

RAFTER, GEORGE W.

Reservoir System of the Great Lakes, 436.

Rainfall, 436.

RAILROADS, BRIDGES.

"The Niagara Railway Arch." R. S. Buck. (With Discussion.) 125.

RAINFALL.

In and adjacent to Basin of the Great Lakes. G. W. Rafter, 436.

RAYMOND, THOMAS L.
Circulation of the Waters in the Gulf of Mexico, 116.
Jetty Construction, 116.
"RELATION OF TENSILE STRENGTH TO COMPOSITION IN Structural Steel— Additional Discussion on Paper No. 811." William R. Webster, 449; A. C. Cunningham, 456; H. H. Campbell, 457; William Metcalf, 458; William R. Webster, 458.
RESERVOIRS.
"Mathematical Analysis of the Influence of— upon Stream Flow." James A. Seddon. (With Discussion.) 401.
Reservoir System of the Great Lakes, etc. Hiram M. Chittenden. (With Discussion.) 355.
"RESERVOIR SYSTEM OF THE GREAT LAKES OF THE ST. Lawrence Basin; Its Relation to the Problem of Improving the Navigation of these Bodies of Water and Their Connecting Channels." Hiram M. Chittenden, 355; "With a Mathematical Analysis of the Influence of Reservoirs upon Stream Flow." James A. Seddon, 401.
Discussion: George Y. Wisner, 428; H. W. Brinckerhoff, 431; J. B. Johnson, 432.
Correspondence: Thomas P. Roberts, 433; George W. Rafter, 436; James A. Seddon, 441; H. M. Chittenden, 443.
RIPLEY, H. C.
Circulation of the Waters in the Gulf of Mexico, 117.
Jetty Construction, 117.
RIVERS.
"Mississippi. Dredges and Dredging on the—" J. A. Ockerson. (With Discussion.) 215.
ROBERTS, THOMAS P. Reservoir System of the Great Lakes, 433.
ROBINSON, A. W. Dredges and Dredging on the Mississippi River. 345.
SCHAUB, J. W. Niagara Railway Arch, 151.
SEDDON, JAMES A. "Mathematical Analysis of the Influence of Reservoirs upon Stream Flow," 401, 441.
SEWERAGE.
"Flushing in Pipe Sewers." H. N. Ogden. (With Discussion.) 1.
SICARD, MIRTILIANO. Memoir of— 577.
SKINNER, F. W. Niagara Railway Arch, 155.
SNOW, CHARLES H. "Marine Wood-Borers," 178.
STEEL. "Relation of Tensile Strength to Composition in Structural—" W. R. Webster. (With Discussion.) 449.

STREAM-FLOW. "Mathematical Analysis of the Influence of Reservoirs upon—" James A. Seddon. (With Discussion.) 401.

SWEITZER, N. B., Jr. "Origin of the Gulf Stream and Circulation of the Waters in the Gulf of Mexico, with Special Reference to the Effect on Jetty Construction," 86, 122.

"THREE-HINGED MASONRY ARCHES; LONG SPANS ESPECIALLY Considered." David A. Molitor, 31.
Discussion: Walter G. Berg, 77; J. B. Johnson, 77; Henry Goldmark, 78.
Correspondence: Gustav Lindenthal, 80; David A. Molitor, 83.

SUSPENSION BRIDGES. "The Niagara Railway Arch." R. S. Buck. (With Discussion.) 125.

TEREDO.
"Marine Wood-Borers." Charles H. Snow. (With Discussion.) 178.

TILLSON, G. W. Flushing in Pipe Sewers, 27.

TIMBER.
Preservation of— Charles H. Snow, 203; W. G. Berg, 210; B. M. Harrod, 210; Henry Manley, 210; Robert Moore, 211; F. Collingwood, 212; L. J. Le Conte, 212.

TRAUTWINE, JOHN C., Jr. Flow of Water in Pipes, 528.

WATER.
Flow of— "Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah." C. D. Marx, C. B. Wing and L. M. Hoskins. (With Discussion.) 471.

WEBSTER, WILLIAM R. "Relation of Tensile Strength to Composition in Structural Steel— Additional Discussion on Paper No. 811." 449, 458.

WESTON, EDMUND B. Flow of Water in Pipes. 548.

WHEELER, W. H. Dredges and Dredging on the Mississippi River, 318.

WILLIAMS, GARDNER S. Flow of Water in Pipes, 528.

WING, CHARLES B. "Experiments on the Flow of Water in the Six-Foot Steel and Wood Pipe Line of the Pioneer Electric Power Company, at Ogden, Utah," 471, 555.

WISNER, GEORGE Y.
Circulation of Waters in the Gulf of Mexico, 113.
Jetty Construction, 113.
Reservoir System of the Great Lakes, 428.

WOOD-BORERS, "MARINE—" Charles H. Snow. (With Discussion.) 178.

WOOD.
Preservation of— Charles H. Snow, 203; Walter G. Berg, 210; B. M. Harrod, 210; Henry Manley, 210; Robert Moore, 211; F. Collingwood, 212; L. J. Le Conte, 212.

WOOLLEY, A. F., JR Dredges and Dredging on the Mississippi River, 329.

WORTHEN, WILLIAM EZRA. Memoir of— 565.

WROTNOWSKI, A. F.
Circulation of Waters in the Gulf of Mexico, 114.
Jetty Construction, 114.

YEATMAN, HENRY CLAY. Memoir of— 579.